

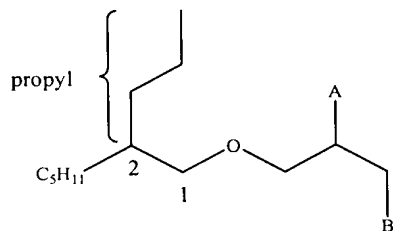
### REQUEST FOR RECONSIDERATION

Claims 1-32 remain active in this application with claims 1-2, 3 and 23 being under active consideration.

The claimed invention is directed to the reaction product of 2-propylheptanol with 2,3-epoxypropanes.

Surfactant compositions, based in-part on their micelle forming ability, have found tremendous use in cleaning compositions. Co-surfactants, which by themselves have insufficient micelle and/or interfacial film forming ability, are nonetheless useful in conjunction with surfactants at forming emulsions allowing for the reduction of surfactant concentration. Known cosurfactants have had associated therewith some drawbacks such that new cosurfactants are sought.

The claimed invention addresses this problem by providing the reaction product of 2-propylheptanol with 2,3-epoxypropanes. Applicants have discovered that such reaction products are useful **cosurfactants** which may be prepared cost-effectively, and are environmentally compatible. The claimed compounds are characterized by a propyl substitution at the 2-position of a heptanol radical.

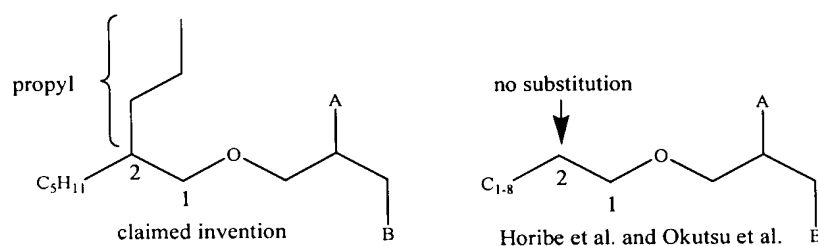


The rejection of claims 1, 2, 3 and 23 under 35 U.S.C. §103(a) over Horibe et al., JP2001/300,286 and Okutsu et al., JP2001/114,719 alone in view of each of Rubinfeld et al., U.S. Patent 3,320,174, Durbut et al., WO97/04059 (Durbut I), Durbut et al., WO98/00418 (Durbut II) and Potterhoff-Karl et al., U.S. 5,994,290 is respectfully traversed.

None of the cited references of record disclose or suggest the claimed compounds bearing a 2-propylheptanol residue.

The combined disclosures of Horibe et al. and Okutsu et al. can be summarized as describing 4-substituted 1,3-dioxolan-2-one compounds in which the methyleneoxy group at the 4-position is substituted with a **linear** C<sub>3-10</sub> alkyl group (C<sub>8</sub> radical Okutsu et al.) (C<sub>4-8</sub> or C<sub>10</sub> radicals Horibe et al.). All of the disclosed examples in the abstract, are 1,3 dioxolane-2-ones with linear alkyl substitution or linear ester substitutions. The compounds are described as **surfactants and emulsifiers** for emulsion polymerization (Horibe). There is no disclosure or suggestion of a propyl substituent at the 2-position of a heptanol residue (e.g. branching) or activity as a co-surfactant.

In contrast, the claimed invention is directed to the reaction product of 2-propylheptanol with 2,3-epoxypropanes such that the compounds bears a 2-propylheptanol residue. Such compounds have been found to exhibit good co-surfactant activity.



Applicants respectfully submit that the claimed 2-propyl substitution of the heptanol residue is neither disclosed nor rendered obvious by the cited references.

The Examiner has categorized the difference between the claimed compounds and those of the primary references as differing in the length of carbon atoms. However, applicants note that the claimed compounds differ from that of the **linear substituted** compounds of the cited references in being a **branched hydrocarbon** chain (e.g., 2-propylheptol) and accordingly cannot be considered to be merely adjacent homologs. The

examiner's fundamental analysis as to the structural differences between the claimed compounds and those of the cited references is in error and accordingly the rejection must be withdrawn.

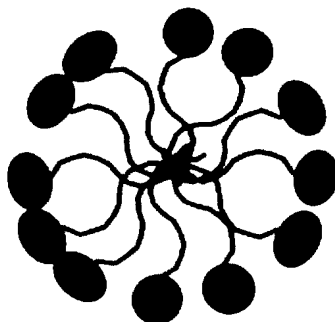
While the examiner has asserted that arguments as to the lack of obviousness of a branched alkyl chain in view of the linear alkyl chain of the cited reference are "foreclosed by the recent decision in *KSR Int. Co. v. Teleflex Inc.*,..." applicants note that *KSR* addressed issues as to obviousness when "a combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." In the chemical arts, and in particular surfactant activity, such a level of predictability is not found.

Even further while the examiner cites to *In re Wood* 582 F.2d 638, 199 USPQ 137 (CCPA 1978) for an equivalency of H with alkyl, applicants note that the compounds in *Wood* were pyrimidine compounds having **an antimicrobial activity**. The equivalency of H with alkyl substitution in co-surfactant compounds has not been demonstrated to be known. If the equivalency is based on the examiner's personal experience, the examiner is invited to provide an affidavit to such effect to allow applicants to seasonably address the issue as to obviousness of surfactant compounds.

Moreover, while the examiner has asserted an equivalency of hydrogen and alkyl substitution, there is nothing in the cited references to suggest any relationship between substitution pattern and surfactant activity. Further since an alkyl substitution is less polar than a hydrogen substitution, the equivalency of hydrogen with alkyl, in the context of surfactant activity is clearly not demonstrated.

To the contrary, the disclosure of the reference compounds bearing linear alkyl substitution as surfactants would not suggest substitution of the linear alkyl groups to be a branched alkyl group, as branching would tend to disrupt the alignment of the linear alkyl group useful in solvating a non-polar phase in a micelle.

Surfactants reduce the surface tension between oil and water by adsorbing at the liquid-liquid interface. Many surfactants can also assemble in the bulk solution into aggregates such as vesicles and micelles. The following illustration of a micelle depicts the orientation of polar groups on the outside and non-polar groups on the inside of an aggregate.



It would not be difficult to envision that introduction of branching groups on the linear alkyl group, to reduce such orienting energy, thereby reducing the tendency to function as an aggregate forming micelle. The reference reports the use of the surfactants in emulsion polymerization, the formation of micelles being of high importance. Therefore, there would be no motivation to introduce branching into the linear alkyl side chain of the surfactants of the cited references as such branching would act contrary to the desired formation of micelle aggregates.

Applicants have discovered the claimed compounds to function as a co-surfactant to a greater degree than previously reported co-surfactants such as alkyl amine oxides. The examiner's attention is again directed to the evidence presented on pages 35-40 of the application. Example 6(a) in which an alkylglycidol carbonate according to the claimed invention is used as a **cosurfactant** in a hand dishwashing detergent. A mixture of alkyl benzene sulfonate, C<sub>13/15</sub> alcohol epoxylate having 7 epoxylation units and 2-propylheptalglycidol carbonate were admixed with varying amounts of C<sub>12/14</sub>-alcohol ethoxylate bearing 3 ethylene oxide units (Lutensol<sup>®</sup> A3N). The mixture was analyzed with

respect to viscosity and compared with formulations in which the claimed 2-propylheptolglycidol carbonate is replaced with Mazox<sup>®</sup> LDA (lauryl amine oxide) or water. Alkyl amine oxides are described by *Smith* as useful cosurfactants (page 3 of applicants' specification). The data is reproduced below:

| 0     | 1     | 2     | 4      | 6      | 8      | % Lutensol <sup>®</sup> A3N   |
|-------|-------|-------|--------|--------|--------|---|
| 3,040 | 3,440 | 8,200 | 12,300 | 18,000 | 52,000 | 2-propylheptyglycidol carbonate<br>(alkylglycidol carbonate of the<br>formula Ic) |
| 1,210 | 905   | 970   | 1,820  | 2,890  | 7,010  | Water   |
| 2,040 | 2,500 | 2,910 | 5,760  | 12,700 | 19,200 | Mazox <sup>®</sup> LDA oxides w.s.  |

As seen in the summarized data on page 38, the claimed compound demonstrated a **greater cosurfactant activity as measured by viscosity** than Mazox<sup>®</sup> LDA at similar concentrations. This may be viewed by comparing the concentration of Lutensol<sup>®</sup> A3N noting that the claimed compound achieved a viscosity of 12,300 with only 4% Lutensol<sup>®</sup> while Mazox<sup>®</sup> LDA required 6% Lutensol<sup>®</sup> in order to achieve a similar viscosity. A similar dichotomy of effectiveness between the claimed compounds and Mazox<sup>®</sup> LDA is seen between the formulations at 6 and 8% Lutensol<sup>®</sup>. Thus, it is clear that the claimed compound has a **greater cosurfactant affect** that Mazox<sup>®</sup> LDA, a **laurylamine oxide**. This data provides evidence of a level of cosurfactant activity which is not suggested by the cited references.

Further evidence of the improved cosurfactant activity is found in the hand dishwashing detergent test appearing on pages 38-39 of the specification. This test measured the **foam stabilization** of the claimed compound as compared with the known cosurfactant alkyl amide oxide Mazox<sup>®</sup> LDA. The test added olive oil to foamed solutions until the foam disappeared.

| additive   | Consumption of olive oil |
|--|--------------------------|
| propylheptyglycidol carbonate<br>(alkylglycidol carbonate of the formula Ic) | 46 mL                    |
| Mazox <sup>®</sup> LDA   | 28 mL                    |
| Water  | 27 mL                    |

The data indicates that the surfactant composition containing the claimed compound consumed significantly greater amounts of olive oil (46 mL) than the lauryl amine oxide cosurfactant (28 mL)(Mazox<sup>®</sup> LDA) containing composition. Accordingly, the greater cosurfactant activity of the claimed compounds have been demonstrated.

None of the secondary references disclose or suggest the claimed structure and are merely cited to describe detergent mixtures. There are no heteroatoms in the side chains of these references. As an oxygen as claimed is more polar than an alkyl group which is non-polar, such references teach away from the claimed oxygen containing compound. The secondary references teach away from inclusion of a polar oxygen group in the side chain. However, since none of the secondary references disclose or suggest the specific 2-propyl substitution of a heptanol, the claimed invention is clearly not rendered obvious by the combination of references and accordingly withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

Applicants note the examiner's denial of applicants' request for priority under 35 U.S.C. §119. The examiner is reminded that

the only times during *ex parte* prosecution that the examiner considers the merits of an applicant's claim of priority is when a reference is found with an effective date between the date of the foreign filing and the date of filing in the United States and when an interference situation is under consideration. (M.P.E.P. §201.15).

As **no intervening reference** has been cited and the examiner has **not indicated that an interference situation is being considered**, the examiner's denial of applicants' request for priority is **improper** and must be withdrawn. Further while 37 CFR 1.55(a)(4)(i)(C)

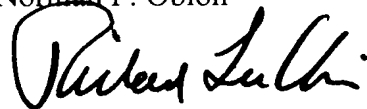
identifies that an English language translation of a non-English language foreign application is not required except: when specifically required by the examiner, applicants note that no requirement has been made by the examiner. Applicants repeat their request for the full benefit of priority to their priority application DE 102 46 140.6 filed on October 10, 2002.

Applicants submit this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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MAIER & NEUSTADT, P.C.

Norman F. Oblon



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